A REVISION OF THE NEARCTIC SPECIES OF JENKINSHELEA MACFIE (DIPTERA: CERATOPOGONIDAE)

William L. Grogan, Jr.
Department of Entomology, University of Maryland, College Park, Maryland 20742

Willis W. Wirth
Systematic Entomology Laboratory, IIBIII, Agr. Res. Serv., USDA[1]

ABSTRACT—The 4 species of *Jenkinshelea* Macfie known to inhabit North America are described and illustrated, and a key is provided for identification. Two species are new, *J.* **stonei** and *J.* **blantoni**, and 2 species groups are recognized, the *albaria* group and *magnipennis* group.

Jenkinshelea Macfie is a small genus of biting midges presently known from 8 species in Africa, Asia, New Guinea, and North America. Wirth (1962a) reviewed the North American species and (1962b) provided some interesting biological data on the pupae of *J. albaria* (Coquillett). Recent collecting in Florida and Texas has resulted in many additional specimens including 2 new species here described.

In the present paper we provide illustrations and keys for the 4 known Nearctic species and recognize 2 species groups. We have found that males of each Nearctic species have distinctive genitalia that facilitate their identification. Females are less distinct, being easy to key to the species group level but much more difficult to determine to species, especially where the ranges of two closely related species overlap. In these instances, we have been able to separate them by differences in size only, making determination of pinned specimens difficult if not impossible.

Materials and Methods

Unless otherwise indicated all specimens examined are on slides and are part of the collection of the National Museum of Natural History (USNM) in Washington, where the types of the new species will be deposited. Paratypes will be deposited in the British Museum (Natural History), London; the Canadian National Collection (CNC), Ottawa; the California Academy of Sciences (CAS), San Francisco; and Cornell University (CU), Ithaca, New York.

For general terminology of Ceratopogonidae see Wirth (1952); terms dealing with male genitalia follow Snodgrass (1957). Unless otherwise indicated measurements and other data are based on specimens mounted on slides in the manner of Wirth and Marston (1968). When possible 10 females of each species were measured and the data presented in the following manner: mean (minimum value–maximum value, n = number of measurements); for new

[1] Mail address: c/o U.S. National Museum, Washington, D.C. 20560.

species actual values are given for the allotype, and the mean, minimum–maximum, and sample size are given in the variation section. The following special terms are used in the description of females: wing length is measured from the basal arculus to the wing tip; antennal proportions (AP) are the relative lengths of the flagellomeres and antennal ratio (AR) is the value obtained by dividing the combined lengths of the proximal 8 flagellomeres into the combined lengths of the distal 5 flagellomeres.

Genus *Jenkinshelea* Macfie

Jenkinsia Kieffer, 1913:161. Type-species, *Jenkinsia setosipennis* Kieffer (original designation). Preoccupied by *Jenkinsia* Jordan and Evermann, 1896.

Jenkinshelea Macfie, 1934:177 (new name for *Jenkinsia* Kieffer). Type-species, *Jenkinsia setosipennis* Kieffer (automatic).

Diagnosis: A genus of large, usually grayish pollinose Sphaeromiine biting midges that can be distinguished from other ceratopogonid genera by the following combination of characters: Anal angle of female wing greatly expanded; wing with 2 radial cells, in the female the 2nd radial cell elongated with the costa nearly reaching wing tip, in males 2nd radial cell extending to 0.75 of wing length; aedeagus of males lacking well-developed basal arms and the anterior margin usually truncate or rounded.

Description: Body slender, usually pollinose, nearly bare. Eyes broadly separated, bare. Palpus slender, 5 segmented; 3rd segment with scattered sensilla but lacking well-defined pit. Female antenna with proximal 8 flagellomeres elongate, distal 5 more elongate; male antenna with distal 3 flagellomeres elongate, plume moderately developed. Scutum without anterior spine or tubercle, broadly rounded anteriorly. Legs slender, unarmed; 4th tarsomere cordiform; 5th tarsomere slender, in female armed ventrally with several stout batonnets, in male unarmed; claws of female equal, each with blunt basal external tooth; claws of male small, equal, with bifid tips, and lacking basal tooth. Wing broad in female with greatly expanded anal angle, narrower in male with anal angle normal; surface with microtrichia only; 2 radial cells present, 2nd greatly elongated in female, nearly reaching wing tip, in male extending to 0.75 of wing length; r-m crossvein long, perpendicular, usually infuscated; media broadly sessile. Female abdomen with sterna and terga fused on segments 8 and 9, forming subcylindrical structures; venter of segment 8 deeply cleft posteriorly with apical dense long setae; 10th sternum with apical pair of large setae; 2 well-developed spermathecae present. Male genitalia elongate; 9th tergum slender, tapering distally with pubescent short cercus; basimere extremely long and slender, telomere long and curved distally; aedeagus fairly short, rounded or truncate on anterior margin, apex usually rounded, lacking well-developed basal arms; claspettes fused, basal arms well developed, distal portion divided, the tips usually slender and bent ventrad.

Immature Stages: Larvae are unknown but are presumed to inhabit the substrate of aquatic situations where they are probably predaceous. Pupae float in water and can be collected along the margins

of streams and ponds where emergence of the adults occurs. Known pupae have membranous ventral adhesive discs on abdominal segments 6 and 7. Just prior to eclosion, pupae climb up emergent vegetation or other available objects to above the water line and attach themselves to these objects with an adhesive fluid from these discs.

Adult Habits: Adults can be collected on vegetation bordering aquatic habitats and are attracted to light traps. Adult feeding habits are unknown but by analogy from related genera females are presumed to prey upon small nematocerans.

Relationships: *Jenkinshelea* is most closely related to the genus *Crispomyia* Debenham (1974) from Australia. Males of *Crispomyia* are unknown but females can be differentiated from those of *Jenkinshelea* on the basis of the following characters:

Jenkinshelea	*Crispomyia*
Eyes broadly separated	Eyes contiguous
Palpus 5-segmented	Palpus 4-segmented (4 & 5 fused)
Fourth tarsomeres cordiform	Fourth tarsomeres cylindrical
Wing with 2 radial cells	Wing with 1 radial cell
Costal ratio 0.98	Costal ratio 0.84–0.89

Key to the Nearctic Species of Jenkinshelea Macfie

1. Females 2
— Males 5
2. Abdominal segments 8 and 9 each with a pair of ventrolateral spinelike sclerotized tubercles; tibiae usually extensively yellowish (*albaria* group) 3
— Abdominal segments 8 and 9 without a pair of ventrolateral spinelike sclerotized tubercles; tibiae blackish (*magnipennis* group) 4
3. Wing length 2.7–3.5 (mean 3.08) mm; antennal ratio 1.27–1.40 (mean 1.34) ..... *albaria* (Coquillett)
— Wing length 2.1–2.8 (mean 2.56) mm; antennal ratio 1.20–1.28 (mean 1.24) ..... *stonei* new species
4. Wing length 3.6–4.0 (mean 3.84) mm; northeastern U.S. and southern Canada ..... *magnipennis* (Johannsen)
— Wing length 2.5–3.3 (mean 3.07) mm; Florida only ..... *blantoni* new species
5. Aedeagus twice as long as broad (*albaria* group) 6
— Aedeagus 1.5 times as long as broad (*magnipennis* group) 7
6. Distal portion of claspettes with long, slender, divergent tips ..... *albaria* (Coquillett)
— Distal portion of claspettes with short, blunt, greatly appressed tips ..... *stonei* new species
7. Aedeagus with rounded tip; distal portion of claspettes with very long, straight, slender, greatly divergent tips ..... *magnipennis* (Johannsen)
— Aedeagus with pointed, bifid tip; distal portion of claspettes with apex bent 90 degrees ..... *blantoni* new species

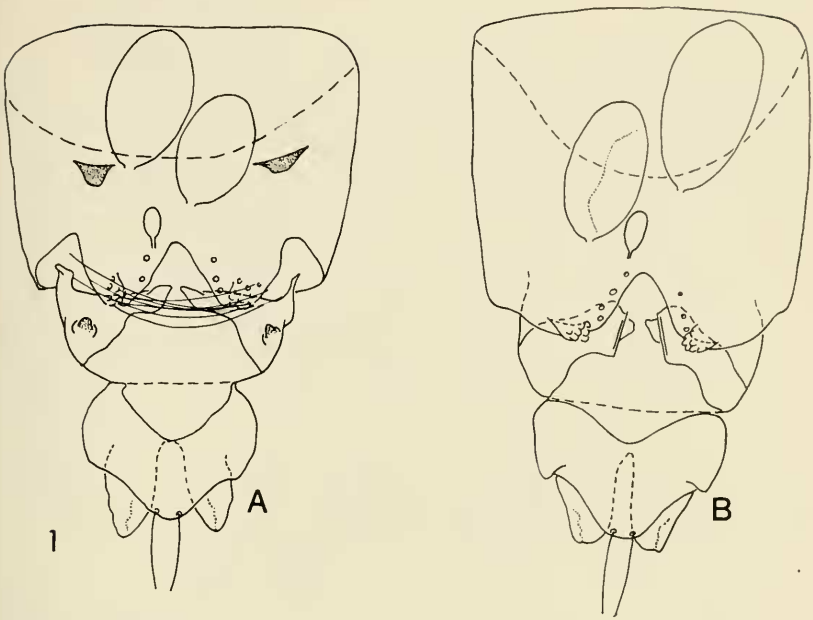


Fig. 1, genitalia of female *Jenkinshelea* spp. A, *J. albaria*. B, *J. blantoni*.

Albaria Group

Females with abdominal segments 8 and 9 each with a pair of ventrolateral spinelike sclerotized tubercles; tibiae usually extensively yellowish. Males with aedeagus twice as long as broad, base truncate or slightly rounded, basal arms reduced or absent.

Jenkinshelea albara (Coquillett)
fig. 1A, 2, 3A, 7A–D

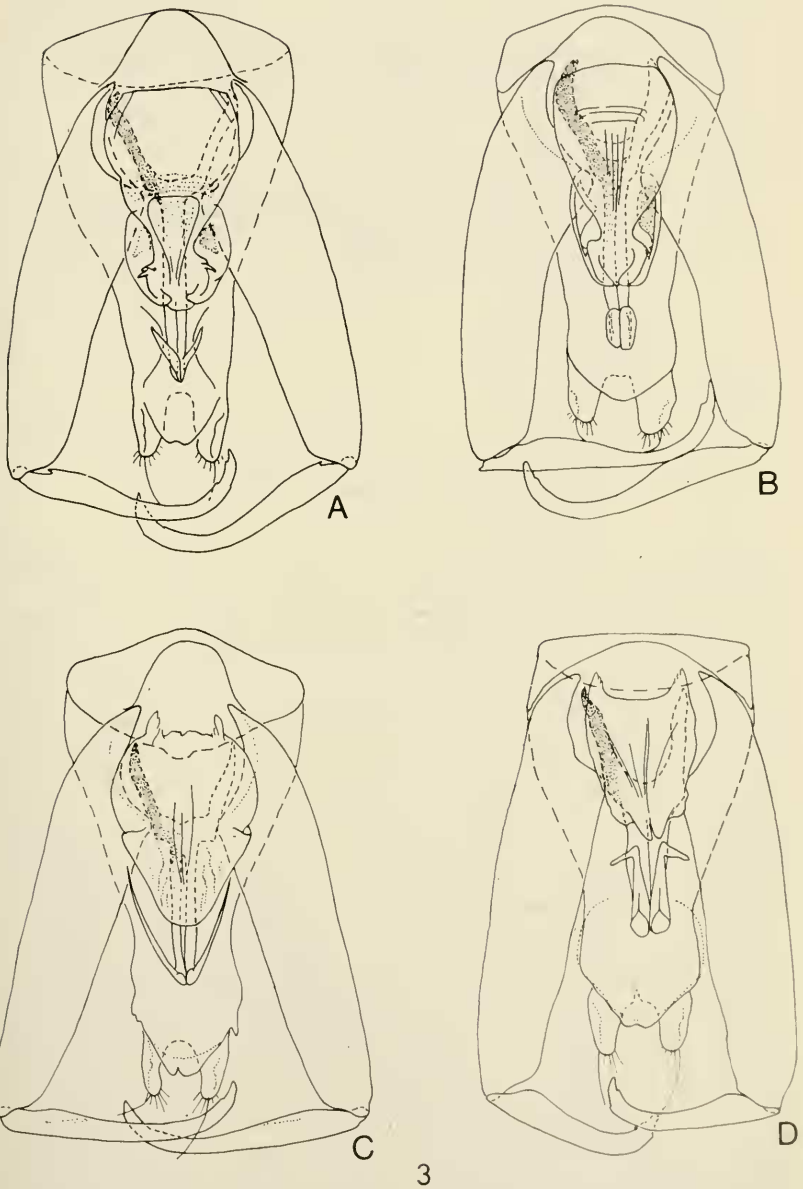
Ceratopogon albarius Coquillett (as *albaria*), 1895:308 (female; Florida).
Johannsenomyia albaria (Coquillett); Malloch, 1915:335 (Illinois; synonym of *Johannsenomyia magnipennis* (Johannsen).
Jenkinshelea albaria (Coquillett); Johannsen, 1943:783 (combination; listed from e. U.S.); Wirth, 1962a:1 (redescription; key; fig. male genitalia); Wirth, 1965: 137 (distribution).
Johannsenomyia aequalis Malloch, 1915:336 (male; Illinois); Johannsen, 1943: 378 (listed from New York); Wirth, 1962a:2 (synonym of *J. albaria*).

Diagnosis: Males distinguished from all other Nearctic *Jenkinshelea* by their claspettes with long, slender, divergent tips and aedeagus nearly twice as long as broad. Females distinguished from all other *Jenkinshelea* except *J. stonei* by the pair of ventrolateral spinelike

Fig. 2, North American locality records for *Jenkinshelea albaria.*

sclerotized tubercles on abdominal segments 8 and 9; from *J. stonei* by their larger size, wing length 2.75–3.53 (mean 3.08) mm, and greater antennal ratio, 1.27–1.40 (mean 1.34).

Female: Wing length 3.08 (2.75–3.53, n = 14) mm; breadth 1.38 (1.15–1.60, n = 12) mm. *Head*: Brown; palpus light brown; vertex grayish pollinose in pinned specimens. Antennal pedicel dark brown; AP 19-10-10-11-11-11-11-11-21-23-24-25-33; AR 1.34 (1.27–1.40, n = 13). Mandible with 7, rarely 8 teeth. *Thorax*: Scutum, scutellum, postscutellum, and pleuron brown; grayish pollinose in pinned specimens. Legs with 2 usual color patterns; a dark form with coxae, trochanters, femora, mid and hind tibiae brown, fore tibia lighter brown; the more common form with fore coxa, trochanters, fore femur, proximal ¾ of mid and hind femora, fore tibia, and broad subapical bands on mid and hind tibia yellowish to light brown; dark brown on mid and hind coxae, fore femorotibial joint, distal ¼ of mid and hind femora, and proximal ½ and apex of mid and hind tibiae; tarsi of both forms pale on tarsomeres 1 and 2, brown on 3–5. Wing as in *J. magnipennis* (fig. 5D). Halter stem pale to light brown; knob white. *Abdomen*: Dorsum whitish except segments 8 and 9 brown; venter reddish brown. Genitalia as in fig. 1A. Eighth segment with pair of large ventrolateral spinelike sclerotized tubercles at midlength; anterior margin truncate, posterior margin with deep cleft. Ninth segment with pair of smaller ventrolateral spinelike sclerotized tubercles at midlength; anterior margin cleft, lobes directed



3

Fig. 3, genitalia of male *Jenkinshelea* spp. A, *J. albaria*. B, *J. stonei*. C, *J. magnipennis*. D, *J. blantoni*.

Fig. 4, North American locality records for *Jenkinshelea stonei.*

slightly anterad. Tenth sternum with pair of large apical setae. Spermathecae ovoid, subequal with short necks.

Male: Smaller, similar to female with following differences: Femora and tibiae entirely brown; halter brown. Genitalia as in fig. 3A. Ninth sternum about twice as broad as long, base nearly straight with a deep caudomedian excavation; 9th tergum tapering gradually on proximal ½, distal ½ tapering slightly with round tip; cercus short, not reaching apex of basimere. Basimere very slightly curved, about 4 times longer than broad; telomere slightly more than ½ the length of basimere, tapering slightly distally with distal ½ greatly curved, nearly hooked. Aedeagus nearly twice as long as broad; base truncate; proximal portion with transverse wrinkles distally; distal portion with distinct peglike sclerotization and with prominent lateral sclerotized lobes. Claspettes fused; basal arm heavily sclerotized, tip curved mesally; distal portion divided, more lightly sclerotized, tips long, slender, divergent, and bent ventrad.

Pupa: Brown. Female operculum (fig. 7A) about as long as broad, surface covered with small rounded tubercles; anterior end rounded, tip pointed; central portion with raised areas bearing pair of tubercles, posterior 1 with single long seta; lateral margins greatly elevated; posterior margin attached. Male operculum similar to that of female but slightly narrower. Respiratory organ (fig. 7B) about 2.5 times longer than broad; surface smooth; apex with double row of 5–8 spiracles. Female terminal segment (fig. 7C) about twice as long as broad; dorsum covered with small pointed tubercles; venter covered with small pointed tubercles except for small circular central area; apicolateral processes moderately divergent, covered with small pointed tubercles. Male terminal segment (fig. 7D) about 1.7 times longer than broad; dorsum covered with small pointed tubercles; venter covered with small pointed tubercles on distal ½, genital processes tightly appressed and very slightly wrinkled; apicolateral processes greatly divergent, covered with small pointed tubercles.

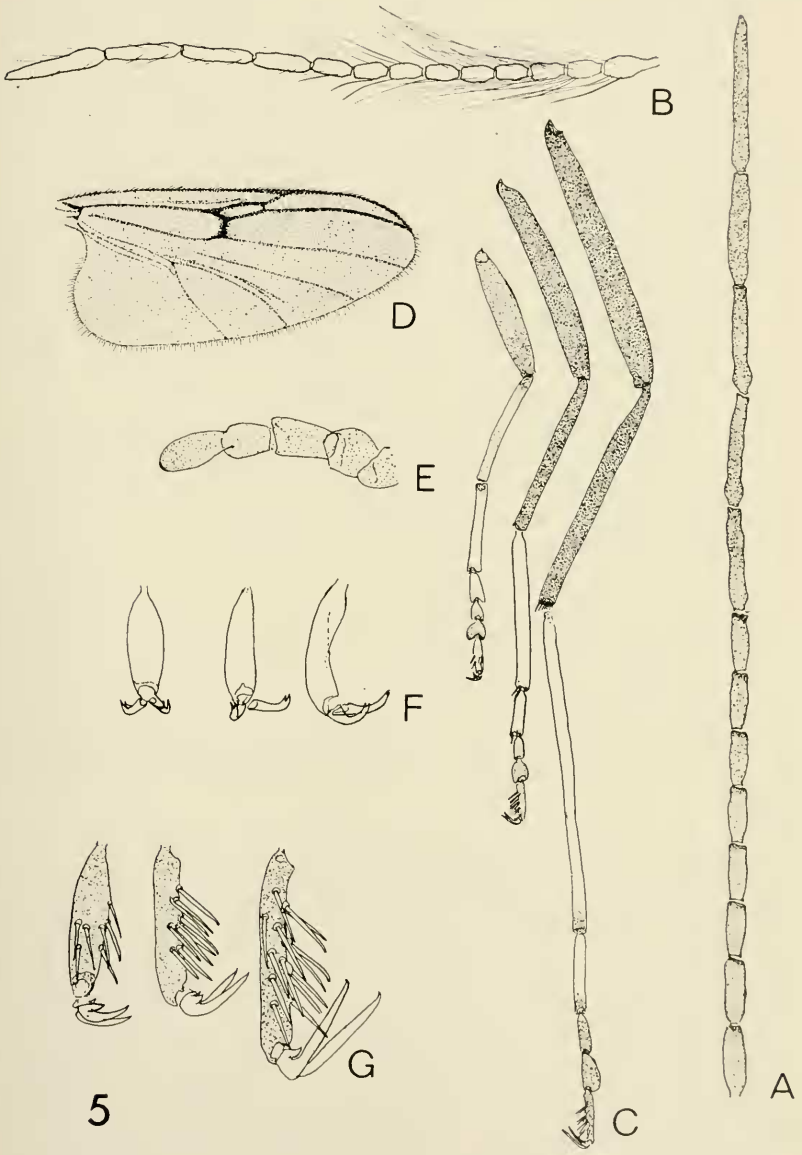


Fig. 5, *Jenkinshelea magnipennis*. A, female flagellum. B, male flagellum. C, female legs. D, female wing. E, female palpus. F, male 5th tarsomeres. G, female 5th tarsomeres.

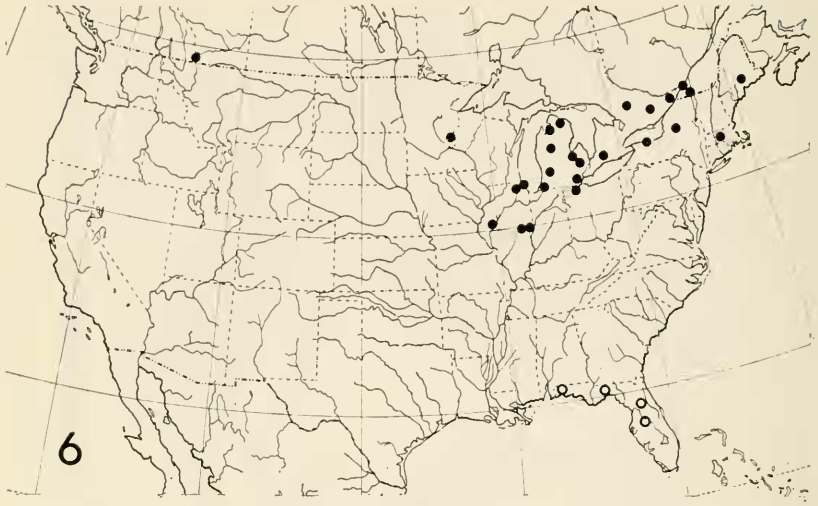


Fig. 6, North American locality records for *J. magnipennis* (solid circles) and *J. blantoni* (open circles).

Distribution: Ontario south to Florida, west to Texas and Illinois (locality records plotted in fig. 6).

Types: Holotype, ♀, of *Ceratopogon albarius* Coquillett: Drayton Island, Putnam Co., Florida, 9 May 1894, C. W. Johnson Type no. 7431 (MCZ). Holotype, ♂, of *Johannsenomyia aequalis* Malloch: Stony Creek, Muncie, Vermilion Co., Illinois, 5 July 1914, J. R. Malloch (INHS).

New Records: FLORIDA: *Alachua Co.*, Gainesville, 20 April 1967, W. W. Wirth, reared from pond margin, 1 ♂. *Glades Co.*, Palmdale, 14 July 1970, E. Irons, light trap, 1 ♀. *Hardee Co.*, Ona, July 1970, E. Irons, 1 ♀. *Jefferson Co.*, Monticello, April 1969, W. H. Whitcomb, black light trap, 1 ♀. *Sarasota Co.*, Myakka River St. Park, 21 May 1973, W. W. Wirth, light trap, 2 ♀. GEORGIA: *Glynn Co.*, Thalmann (CU). MARYLAND: *Montgomery Co.*, Plummer's Island, 2 July 1915, R. C. Shannon, 1 ♀. PENNSYLVANIA: *York Co.*, Conewago Creek, 1 August 1972, W. W. Wirth, light trap, 1 ♀. TEXAS: *Kerr Co.*, Kerrville, August 1953, L. J. Bottimer, light trap, 2 ♂. *Real Co.*, 5 mi. NW of Leakey, reared from Rio Frio, 23 May 1972, W. W. Wirth, 1 ♂. VIRGINIA: *Fairfax Co.*, Potomac River at Scott Run, 12 July 1976, Wirth and Grogan, 1 pupa. ONTARIO: Constance Bay, 21 July 1967, L. Forster, 2 ♂ (CNC).

Discussion: Wirth (1962b) noted the ventral adhesive discs on segments 6 and 7 of the pupa of this species. He observed that pupae placed in glass vials would climb up the sides of the vials and postulated that pupae would similarly climb up emergent vegetation before

eclosion. All of the pupae examined from Virginia, Florida, and Texas had adhesive discs present.

Jenkinshelea stonei Grogan and Wirth, new species
fig. 3B, 4

Jenkinshelea albaria (Coquillett); Wirth, 1962a:1 (in part; Texas records).

Diagnosis: Males distinguished from all other Nearctic *Jenkinshelea* by their claspettes with short, blunt, greatly appressed tips and aedeagus nearly twice as long as broad. Females distinguished from all other Nearctic *Jenkinshelea* except *J. albaria* by the pair of ventrolateral spinelike sclerotized tubercles on abdominal segments 8 and 9; from *J. albaria* by their smaller size, wing length, 2.13–2.79 (mean 2.56) mm and small antennal ratio, 1.20–1.28 (mean 1.24).

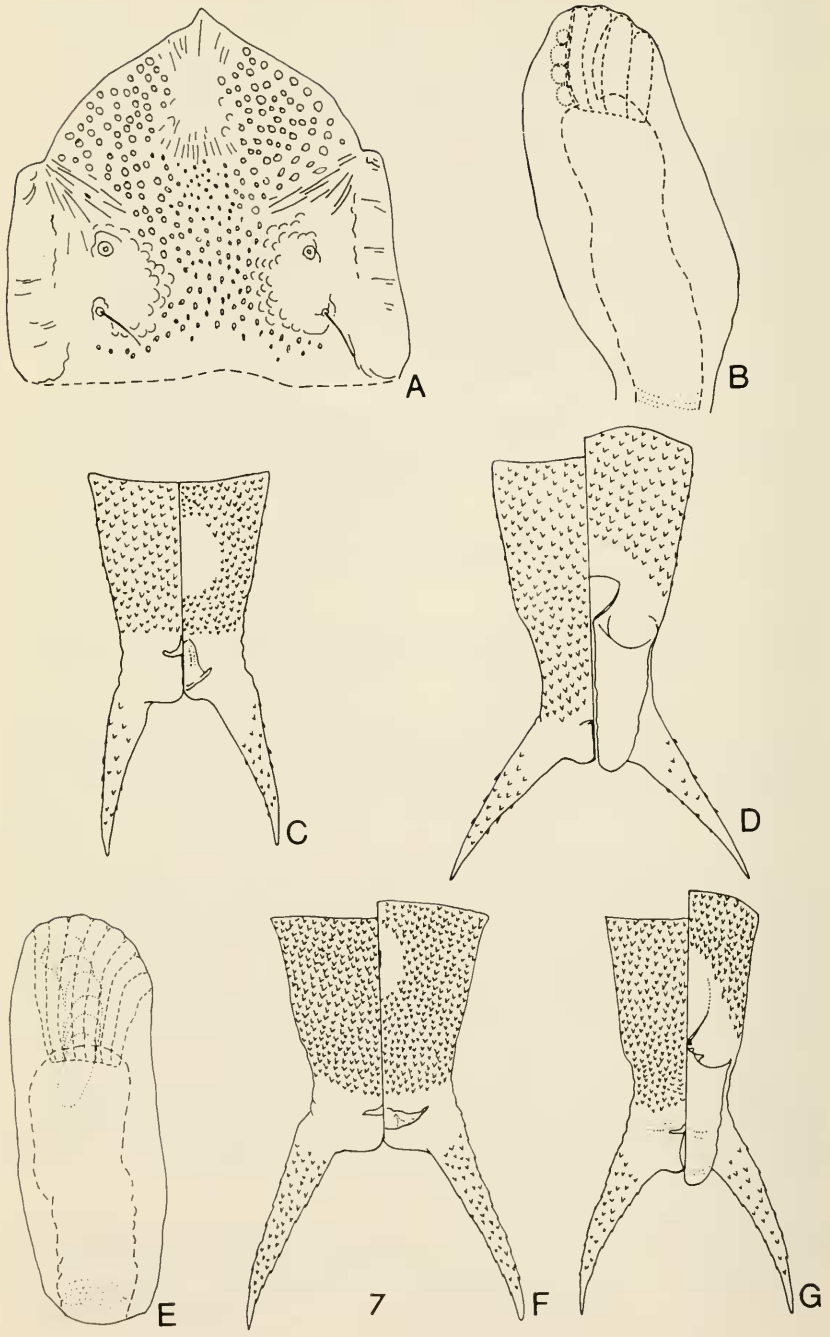
Allotype Female: Wing length 2.79 mm; breadth 1.27 mm. *Head*: Reddish brown; palpus light brown. Antennal pedicel dark brown; flagellum brown; AP 19-10-10-11-12-11-12-13-21-22-25-25-32; AR 1.28. Mandible with 6 large teeth. *Thorax*: Scutum, scutellum, postscutellum, and pleuron dark brown. Fore coxa, trochanters, fore femur, proximal ⅔ of mid femur, proximal ½ of hind femur, fore tibia, broad subapical band on mid and hind femora, and proximal 2 tarsomeres of tarsi yellowish to light brown; mid and hind coxae, fore femorotibal joint, distal ⅓ of mid femur and distal ½ of hind femur dark brown; distal 3 tarsomeres brown. Wing as in *J. magnipennis* (fig. 5D). Halter pale; knob brown. *Abdomen*: Light brown; segments 8 and 9 dark brown. Genitalia as in *J. albaria* (fig. 1A).

Holotype Male: Smaller, similar to allotype female with the following differences: Head dark brown; thorax darker brown; femora and tibiae dark brown; halter brown. Genitalia as in fig. 3B. Ninth sternum about 2.7 times broader than long, base nearly straight with deep caudomedian excavation; 9th tergum tapering gradually distally on proximal ½, distal ½ tapering slightly with round tip; cercus short, nearly reaching apex of basimere. Basimere very slightly curved, about 4 times longer than broad; telomere about 0.6 as long as basimere, tapering slightly distally with distal ½ greatly curved, nearly hooked. Aedeagus about twice as long as broad, base nearly truncate; proximal portion with transverse wrinkles proximally, then longitudinal wrinkles distally; distal portion more or less quadrate with prominent lateral sclerotized lobes. Claspettes fused; basal arm heavily sclerotized, tip curved mesally; distal portion divided, more lightly sclerotized with tips short, blunt, greatly appressed and bent ventrad.

Variation: Females: Wing length 2.56 (2.13–2.79, n = 10) mm; breadth 1.15 (0.90–1.23, n = 10) mm. AR 1.24 (1.20–1.28, n = 9). Mandibular teeth 6–9. All of the female paratypes agree with the allotype in form and coloration. All the male paratypes agree with the holotype in form and coloration.

Etymology: This species is dedicated to Alan Stone in recognition of his outstanding leadership in the field of Dipterology in North America.

Distribution: Florida and Texas (locality records plotted in fig. 4).


A
B
C
D
E
7
F
G

Types: Holotype, ♂, allotype, ♀, Florida Caverns State Park, Jackson Co., Florida, 26 May 1973, W. W. Wirth, light trap (Type no. 71160, USNM). Topoparatypes, 4 ♂♂, 5 ♀♀; other paratypes 7 ♀♀, 2 ♂♂, as follows: FLORIDA: *Escambia Co.*, Walnut Hill, June 1969, F. S. Blanton, black light trap, 1 ♀. *Leon Co.*, Tall Timbers Res. Sta., 29 May 1973, W. W. Wirth, light trap, 1 ♀. *Orange Co.*, Rock Springs, 21 April 1970, W. W. Wirth, light trap, 2 ♀♀. TEXAS: *Gillespie Co.*, Fredericksburg, 30 June 1967, Blanton and Borchers, light trap, 1 ♀. *Jasper Co.*, Jasper, 2 August 1968, R. E. Woodruff, black light trap, 1 ♀. *Kerr Co.*, Kerrville, August 1953, L. J. Bottimer, 1 ♀, 2 ♂♂.

Discussion: Wirth (1962a) considered the 2 male paratypes from Kerr Co., Texas, as atypical *J. albaria* because of their obvious differences in the tips of their claspettes. He recognized that a possible new species was represented by those specimens but declined to name and describe them at the time because of limited material.

Present records indicate that the ranges of *J. stonei* and *J. albaria* overlap in the extreme southeastern U. S. and they have been taken in the same light trap from Kerr Co., Texas. However, further collections are necessary to determine the degree of sympatry that exists between these 2 closely related species.

Magnipennis Group

Females with abdominal segments 8 and 9 without pairs of ventrolateral spinelike sclerotized tubercles; tibiae blackish. Males with aedeagus 1.5 times longer than broad, base with short basal arms.

Jenkinshelea magnipennis (Johannsen)
fig. 3C, 5, 6, 7E–G

Johannseniella magnipennis Johannsen, 1908:268 (male; New York).
Jenkinshelea magnipennis (Johannsen); Wirth, 1962a:3 (redescription; key; fig. male genitalia); Wirth, 1965:137 (distribution).

Diagnosis: Males distinguished from all other Nearctic *Jenkinshelea* by their aedeagus 1.5 times longer than broad with round tip and short submarginal basal arms, and claspettes with very long, slender, straight, greatly divergent tips. Females distinguished from all other Nearctic *Jenkinshelea* except *J. blantoni* by the lack of spinelike tubercles on the venter of abdominal segments 8 and 9; from *J. blantoni* by their larger size, wing length 3.61–4.02 (mean 3.84) mm.

←

Fig. 7, pupae of *Jenkinshelea* spp. A–D, *J. albaria*. E–G, *J. magnipennis*. A, operculum, B and E, respiratory organs, C and F, female terminal segments, D and G, male terminal segments.

Female: Wing length 3.84 (3.61–4.02, n = 10) mm; breadth 1.63 (1.56–1.68, n = 9) mm. *Head*: Brown; palpus (fig. 5E) light brown; vertex grayish pollinose in pinned specimens. Antennal pedicel dark brown; flagellum (fig. 5A) brown, lighter brown occasionally on proximal 8 flagellomeres; AP 24-13-13-13-13-14-14-14-25-27-26-30-38; AR 1.27 (1.19–1.31, n = 8). Mandible with 7, rarely 8 teeth. *Thorax*: Dark brown; grayish pollinose in pinned specimens. Legs (fig. 5C) with coxae, trochanters, femora and tibiae dark brown; tarsi pale on proximal 2 tarsomeres, distal 3 tarsomeres brown; 5th tarsomeres (fig. 5G) with several ventral batonnets, hind claws longer than mid, mid claws longer than fore. Wing (fig. 5D) hyaline; veins light brown, membrane milky whitish on proximal ⅓, pale smoky brown on distal ⅔; r-m crossvein infuscated dark brown. Halter pale to brown. *Abdomen*: Dorsum whitish except brown on segments 8 and 9; venter reddish brown. Genitalia as in *J. blantoni* (fig. 1B).

Male: Smaller, similar to female with the following differences: Flagellum (fig. 5B) entirely brown; 5th tarsomeres (fig. 5F) lacking ventral batonnets, claws small, equal, tips bifid; abdomen entirely brown. Genitalia as in fig. 3C. Ninth sternum about 2.3 times broader than long, base slightly curved with a deep caudomedian excavation; 9th tergum tapering gradually on proximal ½, distal ½ broadening slightly to rounded tip; cercus short, not quite reaching apex of basimere. Basimere straight, about 4.5 times longer than broad; telomere slightly more than ½ the length of basimere, tapering slightly distally with last ¼ greatly curved. Aedeagus about 1.5 times longer than broad; base slightly rounded with short submarginal basal arms; proximal ½ with light wrinkles, transverse mesally, longitudinal marginally; distal ½ with strong longitudinal wrinkles, tip rounded. Claspettes fused; basal arm heavily sclerotized, tip curved slightly mesally; distal portion divided, more lightly sclerotized, tips very long, slender, straight, greatly divergent and bent ventrad.

Pupa: Dark brown. Female and male operculum nearly identical with those of *J. albaria* (fig. 7A). Respiratory organ (fig. 7E) about 3 times longer than broad; surface smooth; apex with double row of about 15 spiracles. Female terminal segment (fig. 7F) about 1.5 times longer than broad; dorsum covered with small pointed tubercles; venter covered with small pointed tubercles except for small central area; apicolateral processes greatly divergent, covered with small pointed tubercles. Male terminal segment (fig. 7G) about twice as long as broad; dorsum covered with small pointed tubercles; venter covered with small pointed tubercles, genital processes greatly appressed and slightly wrinkled; apicolateral processes moderately divergent, covered with small pointed tubercles.

Distribution: Maine west through Quebec and Ontario to British Columbia, south to central Illinois and New York (locality records plotted in fig. 6).

Type: Holotype, ♀, Old Forge, Herkimer Co., New York, 20 Aug. 1905. J. G. Needham (CU).

New Records: BRITISH COLUMBIA: Wasa Lake, 17 July 1974, P. H. Arnaud, Jr., 5 ♀♀, 8 ♂♂ (CAS). NEW YORK: *Cayuga Co.*, Auburn, July 1970, R. C. Miller, prey in nest of *Lindenius c. errans* (Fox), 1 ♀, 10 ♂♂ (pinned). QUEBEC: Abbotsford, 5 July 1936, G. E. Shewell, 1 ♀ (CNC); St. Pierre de Wakefield, 19 June 1974, L. Forster, 6 ♂♂ (CNC). ONTARIO: Black Lake, Stanleyville, 25 June–3 July 1967, J. A. Downes, 1 ♀, 2 ♂♂ (CNC),

25–29 August 1975, W. L. Grogan, Jr., reared from lake margin, 11 ♀♀, 7 ♂♂; Ottawa, 28 July 1939, O. Peck, 5 ♀♀, 1 ♂ (CNC).

Discussion: Grogan reared a large series of *J. magnipennis* from pupae at Black Lake, Ontario, during late June, 1975. Pupae were collected as they crawled up the sides of a painted wooden rowboat along the margin of the lake. Several adults were seen emerging after the pupae had secured themselves to the surface of the boat above the water line. It is suspected that pupae do not crawl out of the water until just before eclosion. Pupae placed in glass vials would climb up the sides of the vials and cement themselves to the glass with an adhesive fluid secreted by their membranous abdominal discs. This behavior is identical to that seen in *J. albaria* by Wirth (1962b). All of the pupae examined by us from Black Lake and Ottawa, Ontario had ventral discs present on abdominal segments 6 and 7.

Jenkinshelea blantoni Grogan and Wirth, new species
fig. 1B, 3D, 6

Diagnosis: Males distinguished from all other Nearctic *Jenkinshelea* by their aedeagus 1.5 times longer than broad with a pointed bifid tip and short marginal basal arms, and claspettes with tips bent at 90 degrees. Females distinguished from all other Nearctic *Jenkinshelea* except *J. magnipennis* by the absence of spinelike tubercles on the venter of abdominal segments 8 and 9; from *J. magnipennis* by their smaller size, wing length 2.46–3.32 (mean 3.07) mm.

Allotype Female: Wing length 3.32 mm; breadth 1.47 mm. *Head*: Dark brown; palpus light brown except 5th segment brown. Antennal pedicel brown; flagellum brown; AP 19-11-11-12-12-12-12-12-24-25-25-24-28; AR 1.25. Mandible with 7 large teeth. *Thorax*: Scutum, scutellum, postscutellum, and pleuron dark brown. Legs dark brown; distal ½ of fore coxa, fore and mid trochanters, bases of fore and hind femora, proximal ⅓ of mid femur, venter of fore tibia, subapical band on mid tibia, and distal 3 tarsomeres of tarsi lighter brown; proximal 2 tarsomeres of tarsi pale. Wing as in *J. magnipennis* (fig. 5D). Halter stem light brown; knob darker brown. *Abdomen*: Light brown except for terminal 3 segments; internally dark reddish brown. Genitalia as in fig. 1B. Venter of segments 8 and 9 lacking spinelike tubercles; venter of 8th segment with deep caudomedian notch. Ninth segment divided ventrally, each ½ with pointed, mesally directed tip. Tenth sternum with pair of large apical setae. Spermathecae ovoid, subequal with short necks.

Holotype Male: Smaller, similar to allotype female with the following differences: Coxae, trochanters, femora and tibiae entirely brown; halter brown. Genitalia as in fig. 3D. Ninth sternum about 4 times broader than long, base straight with broad shallow caudomedian excavation; 9th tergum tapering gradually distally on proximal ⅔, distal ⅓ broadening slightly with rounded tip; cercus short, extending far short of apex of basimere. Basimere straight, about 4.5 times longer than broad; telomere about 0.4 times length of basimere,

tapering slightly distally, distal ⅓ greatly curved. Aedeagus almost 1.5 times longer than broad; base concave with short marginal basal arms; mesal portion with strong longitudinal wrinkles; distal portion with truncate margins, tip divided with each portion pointed. Claspettes fused; basal arm heavily sclerotized, nearly straight; distal portion more lightly sclerotized, bent ventrad, moderately divergent with tips bent 90 degrees.

Variation: Females: Wing length 3.07 (2.46–3.32, n = 10) mm; breadth 1.31 (1.03–1.47, n = 9) mm. AR 1.29 (1.19–1.42, n = 10). All of the female paratypes agree with the allotype in form and coloration. All of the male paratypes agree with the holotype in form and coloration.

Etymology: This species is named for Franklin S. Blanton who collected the type-series and in recognition of his contributions to the study of North American Ceratopogonidae.

Distribution: Florida (locality records plotted in fig. 6).

Types: Holotype, ♂, allotype, ♀, Lon's Lake, Putnam Co., Florida, May 1971, F. S. Blanton, black light trap (Type no. 71161, USNM). Topoparatypes, 20 ♀♀, 34 ♂♂; other paratypes, 4 ♀♀, 1 ♂, as follows: FLORIDA: *Polk Co.*, Lake Alfred, October 1952, M. H. Muma, 1 ♀. *Santa Rosa Co.*, Blackwater A. and M. Biological Station, 21 May 1971, G. B. Fairchild, black light trap, 2 ♀♀. *Wakulla Co.*, Ocklokonee River St. Park, 29 April 1970, W. W. Wirth, light trap, 1 ♀, 1 male.

For the loan of types or other specimens we are grateful to the following: L. L. Pechuman, Cornell University (CU), Ithaca, New York; Paul H. Arnaud, Jr., California Academy of Sciences (CAS), San Francisco, California; and J. Antony Downes, Canadian National Collection (CNC), Ottawa, Canada. We are especially indebted to Ethel L. Grogan and Niphan C. Ratanaworabhan for preparing the illustrations.

References

Coquillett, D. W. 1895. Descriptions of new genera and species. pp. 307–319, *In*: C. W. Johnson, Diptera of Florida. Proc. Acad. Nat. Sci. Phil. 1895:303–340.

Debenham, M. L. 1974. A revision of the Australian and New Guinea predatory Ceratopogonidae (Diptera: Nematocera) of the tribes Heteromyiini and Sphaeromiini. Australian J. Zool. Suppl. Ser. 28:1–92.

Johannsen, O. A. 1908. New North American Chironomidae. Bull. New York St. Mus. 124:264–285.

———. 1943. A generic synopsis of the Ceratopogonidae (Heleidae) of the Americas, a bibliography, and a list of the North American species. Ann. Entomol. Soc. Amer. 36:763–791.

Kieffer, J. J. 1913. Nouvelle étude sur les Chironomides de l'Indian Museum de Calcutta. Rec. Indian Mus. 9:119–197.

Macfie, J. W. S. 1934. Report on a collection of Ceratopogonidae from Malaya. Ann. Trop. Med. Parasitol. 28:177–194, 279–293.

Malloch, J. R. 1915. The Chironomidae or midges of Illinois. Bull. Illinois St. Lab. Nat. Hist. 10:275–543.

Snodgrass, R. E. 1957. A revised interpretation of the external reproductive organs of male insects. Smithson. Misc. Colls. 135:1–60.

Wirth, W. W. 1952. The Heleidae of California. Univ. California Publ. Entomol. 9:95–266.

———. 1962a. The North American species of the biting midge genus *Jenkinshelea* Macfie (Diptera: Ceratopogonidae). Bull. Brooklyn Entomol. Soc. 57:1–4.

———. 1962b. A reclassification of the *Palpomyia-Bezzia-Macropeza* groups, and a revision of the North American Sphaeromiini (Diptera: Ceratopogonidae). Ann. Entomol. Soc. Amer. 55:272–287.

Wirth, W. W. and N. Marston. 1968. A method for mounting small insects on microscope slides in Canada balsam. Ann. Entomol. Soc. Amer. 61:783–784.